Facilities Engineering Technology (FENG)

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FENG 120 : Facility Safety and Accident Prevention

Credits: 1
Class Hours: 1 lecture
Description: This is an introductory course on facility maintenance safety, including the effect it has on productivity and employee morale. The course includes application of a safety program into basic accident prevention. Students will learn and evaluate various federal (Occupational Safety and Health Administration -- OSHA), state, and local laws governing safety. Topics include hazardous chemicals, fall protection, electrical safety, and drugs in the workplace.
Semester Offered: Fall, Spring
Course Student Learning Outcomes (CSLOs):

1. Demonstrate an understanding of the requirements of an employee and employer with respect to the OSHA guidelines of federal and state laws.
2. Demonstrate an understanding of the information contained in an MSDS.
3. Describe basic accident prevention guidelines for a given task.
4. Identify the hazards and the risks that all employees are exposed to and the law regarding the use of drugs in the workplace.
5. Demonstrate the proper use of ladders and scaffolding.
6. Demonstrate the proper use of electrically energized equipment.
7. Assess a task for risks and to utilize the proper procedures to perform the task.

FENG 121 : Introduction to Building Maintenance

Credits: 3
Class Hours: 1 lecture and 4 lecture/lab
Prerequisites: "C" or higher or concurrent enrollment in CARP 120B.
Description: This course in general building and facilities maintenance covers carpentry skills in blueprint reading, measuring, framing, and exterior and roof finishes. This course also covers masonry skills in blue print reading, brick size and texture, types of walls, foundations, anchors, concrete mixes, forms, stone, and plaster. Other topics include troubleshooting, preventive maintenance, and safety.
Semester Offered: Fall
Course Student Learning Outcomes (CSLOs):

1. Evaluate the condition of various materials requiring maintenance attention.
2. Interpret the architectural scales typically used in drawings and translate them to real world measurements.
3. Demonstrate the proper selection of fasteners for a variety of typical finishes to determine those that are best suited for the task.
4. Demonstrate the proper safety precautions necessary for a given task.
5. Demonstrate the ability to read and comprehend architectural blueprints.
6. Demonstrate the ability to perform basic troubleshooting skills when assessing common materials used to complete tasks.
7. Demonstrate the ability to understand the information contained in the schedules of architectural blueprints and locate detailed information.
8. Demonstrate the ability to understand the goals of a maintenance program.
9. Demonstrate the ability to determine the correct replacement parts from operations and maintenance manuals.

FENG 123 : Plumbing Basics and Repair

Credits: 2
Class Hours: 1 lecture and 2 lecture/lab
Recommended: "C" or higher or concurrent enrollment in CARP 120B.

Description: This course provides an overview of the plumbing systems and the materials, tools, and techniques used in the repair and maintenance of the fixtures and appliances found in a building. Included are safety precautions, tool selection, and an introduction to the codes that apply to a plumbing system.
Semester Offered: Spring
Course Student Learning Outcomes (CSLOs):

1. Describe the three systems that comprise the plumbing system in a typical building.
2. Demonstrate the ability to describe a supply system and its components.
3. Demonstrate the ability to describe the waste and vent systems and their components.
4. Demonstrate the ability to select and use the proper tools for a given task in the supply system.
5. Demonstrate the ability to select and use the proper tools for a given task in the waste or vent systems.
6. Demonstrate the proper selection and installation of the materials for a supply system.
7. Demonstrate the proper selection and installation of the materials for a waste or vent system.
8. Describe the fixtures and appliances found in a typical plumbing system.
9. Demonstrate the ability to determine the type of valve assembly and the repair techniques for a given assignment.
10. Demonstrate the ability to repair and replace various components of a water closet and toilet.
11. Describe the sequence used to replace a hot water heater.
12. Demonstrate the ability to perform basic troubleshooting techniques on a plumbing system.

FENG 130 : Basic Fundamentals of Air Conditioning and Refrigeration

Credits: 3
Class Hours: 2 lecture and 2 lecture/lab
Prerequisites: "C" or higher or concurrent enrollment in EIMT 121 or EIMT 123.
Description: This course offers the basic principles and fundamentals of air conditioning and refrigeration. The course is designed to expose students to the theory and methods of maintaining, diagnosing, and minor repairing of domestic and commercial air conditioning/refrigeration systems.
Semester Offered: Fall
Course Student Learning Outcomes (CSLOs):

1. Demonstrate an understanding of basic electrical theory.
2. Demonstrate an understanding on the theory of refrigeration.
3. Demonstrate an understanding of matter and energy.
4. Demonstrate an understanding of refrigerants and refrigeration.
5. Demonstrate general safety practices, including the safe handling of tools and equipment.
6. Identify tubing and piping components and their removal and installation.

FENG 140 : Commercial Refrigeration and Air Conditioning Diagnostics

Credits: 3
Class Hours: 2 lecture and 2 lecture/lab
Prerequisites: “C” or higher in FENG 130.
Description: This course builds on the skills acquired in the FENG 130, Basic Fundamentals of Air Conditioning and Refrigeration, course. This develops practical skills for technicians, air conditioning and refrigeration helpers, and an introduction to mechanical engineering. This course covers the performance evaluation on working systems under various conditions along with developing refrigerant diagnostic skills. EPA Recovery Certification is required.
Semester Offered: Spring
Course Student Learning Outcomes (CSLOs):

1. Demonstrate an understanding of the terms related to the various systems, including identifying the states of refrigerant at various points in the system, calculating and verifying the performance of a basic system on paper and during actual operation.

2. Demonstrate the proper safety procedures involved in working with refrigerants including the ability to select classifications of accidents in the refrigeration shop, complete specific safety rules which apply to the trade, identify electrical safety problems and find specific solutions, and understand proper labeling and tags.
3. Demonstrate the ability to determine the normal operating conditions of air conditioning and refrigeration equipment using temperature differences of the condensers and evaporators, humidity and wet bulb characteristic of evaporators, and superheat and subcooling measurements.
4. Demonstrate the system diagnostic techniques for overcharged and undercharged systems, including restrictions in tubing, filters, metering devices, air flow restrictions and their effects on system performance using calculated data, lab data, and computer simulations.
5. Demonstrate the use of proper techniques and equipment to perform refrigerant evacuation, recovery, and charging techniques and the use of specific equipment to perform these operations.
6. Identify common accessories and their location, and distinguish between types of service valves.